



October 11, 2005

California Energy Commission
Committee Hearing on Transportation Fuels, Thursday, Sept. 29, 2005
Draft Energy Report, Chapter 2

Reference: 04 IEP 1K Committee Draft Document Hearings

Dear California Energy Commission,

Thank you for the opportunity to review and comment on the Transportation Energy Chapter of the Integrated Energy Policy Report. Per instruction from the public notice for the Sept. 29 CEC Committee Hearing on Transportation Fuels, we are submitting these comments for inclusion in the CEC docket, "04 IEP 1K Committee Draft Document Hearings."

Our specific interest with these comments is in bringing information forward about the costs of heavy-duty diesel vehicle emissions compliance technology in the 2007 and 2010 timeframes. Of particular concern to us is the CEC staff's pricing analysis comparing natural gas vehicle technology to clean heavy-duty vehicle technology.

CEC Staff's 2010 Pricing Analysis for Heavy-Duty Diesel

In summary, we believe the staff's pricing analysis is wrong, that it is based on biased and/or ill-informed sources, that it depends on a "closed-loop" system of information gathering in which the CEC quotes the natural gas vehicle industry which, in turn, quotes the CEC staff and so on, and that it runs counter to the CEC's stated goal of developing transportation energy policies that are "fuel neutral."

Specifically, we reference a paragraph in the IEPR May 17 Hearing Appendixes found on pg 159 – the medium/heavy duty analysis, which starts on page 154:
<http://www.energy.ca.gov/2005publications/CEC-600-2005-024/CEC-600-2005-024-ED2-AD.PDF>

Cost to Meet Emission Standards

Based on published industry information and analysis of costs to comply with emission standards by the U.S. Environmental Protection Agency (EPA), the supporting analysis found that advanced NG (natural gas) vehicles in the matured market are likely to cost up to \$15,000 more than NG vehicles manufactured before 2010. The post 2010 incremental cost is in addition to today's declining incremental vehicle costs of \$11,000 (Class 3-6 vehicles) to

\$28,000 (Class 7-8 vehicles) for fuel system and on-board storage compared to conventional diesel vehicles. These higher but declining incremental costs are assumed to influence consumer purchase decisions and therefore modulate advanced vehicle penetrations. *Comparably higher costs for diesel engines to meet the 2007 emission standards suggest price parity and even price advantage may materialize for medium- and heavy-duty NG vehicles in a range of applications. Literature reviews(*) and industry data suggest that by the year 2010, Class 3-6 heavy-duty NG vehicles are likely to achieve price parity with comparable diesel engines. Similarly, by 2010, available data suggest Class 7 and 8 NG vehicles are likely to achieve price parity or enjoy a price advantage over comparable diesel vehicles. By 2025, NG vehicles in the full range of medium- and heavy-duty vehicle classes 3 through 8 are price competitive with their diesel counterparts. (Emphasis added.)* The narrowing costs between the NG vehicles and competing diesel vehicles make the NG vehicles relatively attractive.

The U.S. EPA paper quoted in this section cites the incremental vehicle cost for diesel class 8s to be significantly below \$900 dollars, and does not support the CEC staff's assertion. The CEC analysis direction was to determine the "mature" prices of vehicles i.e. after the initial price run ups generally associated with significant regulatory changes.

CEC Staff's 2007 Pricing Analysis for Heavy-Duty Diesel

Additionally, we submitted for the docket on Oct. 3, 2005, the executive summary of a study prepared for the Engine Manufacturer's Association and the Diesel Technology Forum by NERA Economic Consulting and Air Improvement Inc. titled, "Economic and Environmental Impacts of EPA's 2007 Heavy-Duty Emissions Standards" that addresses the emissions cost compliance question. As well, an executive summary of the NERA study was presented in person to the CEC staff on Sept. 27.

The NERA study, which references pricing information gleaned directly from heavy-duty diesel vehicle and engine manufacturers, shows 2007 compliance costs are some \$20,000 lower than the CEC staff estimates for a 2005 compliant vehicle relative to 2002 MY, and \$35,000 less than the CEC's 2010 projected values. While we understand that these cost figures do not align up with the time frame of the CEC staff's analysis, they do illustrate a significant chasm between the CEC analysis and the diesel industry's and EPA's perspectives.

Information Sources and Conjecture (*)

We also note with the (*) in the above citation that the CEC staff is relying heavily on a June 2002 "Newport Communications'-Heavy Duty Trucking Magazine" article for many of these values. While interesting, such magazine articles are hardly the most reliable source of pricing conjecture, which, if acted upon by CEC commissioners, can have a significant impact on the future of California's transportation energy demand. The article cited is a review of 2002 model year price increases based on advance pricing information. A second article in the same issue (Editor Deborah Whistler's column "Clean Air: Who Pays?") presents some relevant data for the discussion. She notes that even with the proposed increases for the 2002 models (and only Kenworth is cited since that is the only "official" data the magazine had at the time) the retail prices of Class 8 Heavy-

duty trucks had only increased 37% in the previous 20 years (since 1982) in spite of numerous cost increases for manufacturers in meeting emissions and safety regulations during those years. She also noted that engine durability, longevity, performance and ride had all increased during the intervening years. "How much longer can this industry be expected to absorb all the costs of government compliance?" she asks rhetorically.

We understand the need for CEC staff to seek information on emissions compliant technology for the 2010 model year, and to gravitate toward sources that are easily available. However, it is the DTF's view that it is unreasonable to ask the technology pricing question for 2010 vehicles today from the heavy-duty diesel industry, just as it would be unreasonable to ask automakers to predict what car prices will be five years from now.

We are five years away from the emissions compliance deadline and industry is working to develop this technology. For example, Caterpillar has said publicly that it has 2010 technology that meets the 2010 standards in the lab *today* – but no one can reasonably be expected to predict costs – and we should reject as unreasonable and outside normal forecasting for the diesel industry to do it.

We respectfully submit that it is irrational to assume that the technology that moves more than 90 percent of the commercial freight in this country suddenly costs everyone 20 or 30 percent more than it did the year before. The market simply will never let that happen. If the clean diesel industry saw it coming that way, manufacturers would never have agreed to the 2010 emissions compliance step.

Closed-Loop Information Gathering

Over the past several months, the NGV industry has been touting the findings of an EPA emission standards cost compliance estimate compiled by TIAX, released in July 2005. We have some general observations of that report that we believe may benefit the CEC staff in future efforts to project costs.

- (1) The TIAX report was funded by South Coast Air Quality Management District and Southern California Gas Co., reviewed ("improved," according to the authors) by these groups and first published on the California Natural Gas Vehicle Partnership website. As such, it should not be viewed as neutral.
- (2) The study authors looked only at three market segments, not surprisingly the first two of which are the ones most closely targeted by the NGV industry because they are most likely to have government subsidies for vehicle purchases, since they are public or quasi-public entities, i.e. transit buses, refuse haulers. The third category is short-haulers. Note they do not address the biggest segment of the heavy-duty market, the Class 8 over-the-road trucks.

- (3) The focus of the report is on life-cycle costs, again no surprise since this is where NGVs can leverage lower fuel costs to their advantage. But life cycle costs are not that much of a purchase factor for many heavy truck buyers. Even the lower fuel costs for natural gas are trumped by the inconvenience of its refueling infrastructure in this market segment. One of the caveats pointed out in the TIAx study summary is that diesel vehicle cost projections are subject to variation because of the uncertainty about what technologies will be used to meet 2010 emissions regulations. They include at least seven possible options and note that there may be others in development.

Faulty Assumptions

There are key assumptions in the TIAx report that are necessary to make NGV competitive with diesel in 2010 (when there will be no emissions benefit for the engines). Some of our observations:

- (1) Assumption – That the NGV market share will grow to 12.5% (it is currently less than 5% and apparently shrinking). If NGVs don't increase to that market share, they are not competitive even on a life cycle basis. This increased market share allows the analysts to lower the overall cost of NGV engines from their current higher level by projecting volume production efficiencies. This projection appears to underlie the CEC projection of a 15-25% NG vehicle share in 2025, which is explicitly based on the transit sector. That sector, as noted in the TIAx report, is one in which vehicle price is not a factor because it is typically subsidized 80% by government for diesel vehicles and 90% for CNG ones.
- (2) Note the loop – This report cites on Page 4 CEC and CARB projections that diesels will be more expensive, while it seems clear that CEC and CARB have made its projections based on NGV industry speculation.
- (3) Other assumptions that skew the numbers in NGV's favor are the assumed cost of diesel after-treatment equipment (\$2,000-\$5,000, compared to minimal equipment needed by NGV engines), the price ratio of natural gas to diesel (assumed to be 80%-86%), the overall cost of petroleum, and the price ratio of LNG to CNG. The study also assumed vehicle fuel economy, durability and maintenance cost parity.
- (4) TIAx developed its own estimates for after-treatment equipment costs, drawing heavily from its own earlier reports in the area. This report's estimates for projected costs are strongly qualified since "no production system exists today to meet the standards" and "uncertainty exists in the type of technology that will be employed." TIAx did compare its estimates with EPA and DOE data. Finally, the report assumes much less progress in basic diesel engine emissions technology than is attributed to CNG engines, in our opinion.
- (5) Natural gas technology costs came from the CEC AB 2076 report (closed loop again, since that data appears to have come from TIAx and the NGV industry).

- (6) A number the study contains but doesn't highlight is the comparable engine costs projected for 2010 in spite of the above assumptions: Diesels are expected to be \$9,000 to \$22,000 less than comparable CNG vehicles in the three categories studied.

Fuel Pricing

Finally, we must make note of recent pricing events that probably will have a long-term impact on CNG retail prices, something which is notably absent from much of the CEC's analysis.

As noted in media reports during the week of Oct. 3-7, the U.S. Senate Energy and Natural Resources Committee conducted hearings at which it was learned that the U.S. is in a "natural gas crisis," that U.S. natural gas prices are among the highest in the world, and that this pricing trend may continue for many years.

Of particular note is this widely circulated quote from Karen Wayland, the Washington-based legislative director of the Natural Resources Defense Council: "We just don't have enough natural gas out there to meet our long-term needs. The only answer, especially in the short term, is energy efficiency."

We wholeheartedly agree. Clean diesel is one of the most fuel-efficient vehicle propulsion technologies ever developed. As such, it deserves a larger role in California's energy future and an honest assessment of its emissions technology and costs.

Very truly yours,

A handwritten signature in black ink that reads "Allen R. Schaeffer". The signature is fluid and cursive, with the first name "Allen" and last name "Schaeffer" clearly legible.

Allen Schaeffer, Executive Director
Diesel Technology Forum
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